

CLAIMS

What is claimed is:

1. A semiconductor device, comprising:
a first carrier substrate;
a first semiconductor chip mounted face down on the first carrier substrate;
a second semiconductor chip mounted face down on a reverse face of the first carrier substrate;
a second carrier substrate;
a third semiconductor chip mounted on the second carrier substrate; and
protruding electrodes connecting the second carrier substrate to the first carrier substrate so that the second carrier substrate is held above the first semiconductor chip.
2. The semiconductor device according to Claim 1,
wherein the second carrier substrate is fixed to the first carrier substrate so as to be mounted on the first semiconductor chip.
3. The semiconductor device according to Claim 1, further comprising a sealant for sealing the third semiconductor chip.
4. The semiconductor device according to Claim 3,
wherein the sealant further comprises a molded resin.

5. The semiconductor device according to Claim 4,
wherein a position of a sidewall of the sealant coincides with a sidewall of the second carrier substrate.

6. The semiconductor device according to Claim 1,
wherein the first semiconductor chip and the second semiconductor chip are connected to the first carrier substrate by pressure welding.

7. The semiconductor device according to Claim 1,
wherein, at the same temperature, an elastic modulus of a semiconductor device comprising the first carrier substrate is different from an elastic modulus of a semiconductor device comprising the second carrier substrate.

8. The semiconductor device according to Claim 1,
wherein the first carrier substrate on which the first semiconductor chip and the second semiconductor chip are mounted further comprises a flip-chip-mounted ball grid array, and

wherein the second carrier substrate on which the third semiconductor chip is mounted further comprises at least one of a mold-sealed ball grid array and a chip size package.

9. The semiconductor device according to Claim 1,
wherein the third semiconductor chip comprises a structure in which a plurality of chips is stacked.

10. The semiconductor device according to Claim 1,
wherein the third semiconductor chip comprises a structure in which a plurality of chips is arranged in parallel on the second carrier substrate.

11. An electronic device, comprising:
a first carrier substrate;
a first semiconductor chip mounted face down on at least one face of the first carrier substrate;
a second carrier substrate;
a second semiconductor chip mounted on the second carrier substrate;
a third semiconductor chip mounted on a reverse face of the second carrier substrate; and
protruding electrodes bonding the second carrier substrate to the first carrier substrate.

12. A semiconductor device, comprising:
a carrier substrate;
a first semiconductor chip mounted face down on the carrier substrate;
a second semiconductor chip mounted face down on a reverse face of the carrier substrate;
a third semiconductor chip on which re-arrangement wiring line layers are formed on surfaces where electrode pads are formed; and
protruding electrodes connecting the third semiconductor chip to the carrier substrate so that the third semiconductor chip is held above the first semiconductor chip.

13. An electronic device, comprising:
- a first carrier substrate;
 - a first electronic part mounted on the first carrier substrate;
 - a second electronic part mounted on a reverse face of the first carrier substrate;
 - a second carrier substrate;
 - a third electronic part mounted on the second carrier substrate;
 - protruding electrodes connecting the second carrier substrate to the first carrier substrate so that the second carrier substrate is held above the first electronic part; and
 - a sealant for sealing the third electronic part.
14. An electronic device, comprising:
- a first carrier substrate;
 - a semiconductor chip mounted on the first carrier substrate;
 - a second semiconductor chip mounted on a reverse face of the first carrier substrate;
 - a second carrier substrate;
 - a third semiconductor chip mounted on the second carrier substrate;
 - protruding electrodes connecting the second carrier substrate to the first carrier substrate so that the second carrier substrate is held above the first semiconductor chip;
 - a sealant for sealing the third semiconductor chip; and
 - a mother substrate on which the first carrier substrate is mounted.

15. A method of manufacturing a semiconductor device, comprising the steps of:

mounting a first semiconductor chip face down on a first carrier substrate;

mounting a second semiconductor chip face down on a reverse face of the first carrier substrate;

mounting a third semiconductor chip on a second carrier substrate;

forming protruding electrodes on the second carrier substrate;

sealing a third semiconductor chip mounted on the second carrier substrate with a sealing resin; and

connecting the second carrier substrate to the first carrier substrate via protruding electrodes so that the second carrier substrate is held above the first semiconductor chip.

16. The method of manufacturing a semiconductor device according to Claim 15, wherein the step of sealing the third semiconductor chip with the sealing resin comprises the steps of:

integrally molding a plurality of the third semiconductor chips, which are mounted on the second carrier substrate, with the sealing resin; and

cutting the second carrier substrate molded with the sealing resin into pieces so that each piece includes one of the third semiconductor chips.

17. A method of manufacturing an electronic device, comprising the steps of:

mounting a first electronic part face down on a first carrier substrate;

mounting a second electronic part face down on a reverse face of the first carrier substrate;

mounting a third electronic part on a second carrier substrate;

forming protruding electrodes on the second carrier substrate;

sealing the third electronic part, which is mounted on the second carrier substrate, with a sealing resin; and

connecting the second carrier substrate to the first carrier substrate via the protruding electrodes so that the second carrier substrate is held above the first electronic part.